Passive Panoramic Image Fusion (PPIF) for 360 Degree Situational Awareness to Support Operations in Urban Terrain

Presentation to
Autoliv Electronics

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PPIF System Benefits

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- Provides 360 degree situational awareness to the crew of a armored combat, surveillance and troop transport vehicle during the day or night. Real time, pixel based fusion of infrared and visual video with pan and zoom capability.

- Aids Armed Urban Operations with:
  - Surveillance
  - Peace keeping operations
  - Perimeter control

- 3 Band Fusion
  - Near IR
  - Far IR
  - Visible

Night Vision (IR) and Visual Image Fusion in Real-Time

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

Visible image shows:

-Other vehicles

-Blinker, break lights lane markings

-Signs

Infrared image shows:

-Other vehicles

-Persons and animals

-Road beyond headlights

But only infrared image fused with visible light image show all features

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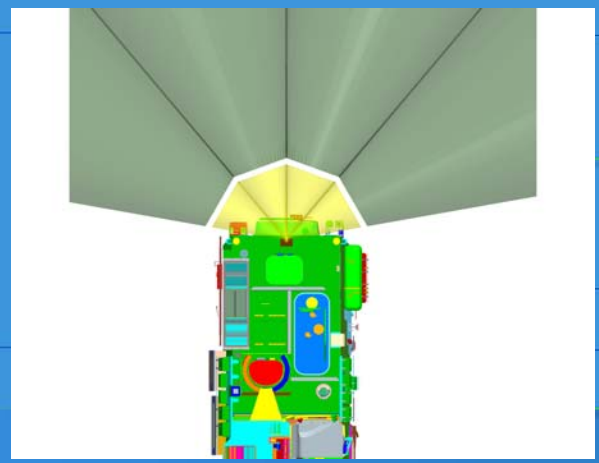
Navigator Prototype Kit

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

Fully Passive 360° Image Fusion Technology for Homeland Defense with Modular Camera Kit



Present Version of System

Rugged version

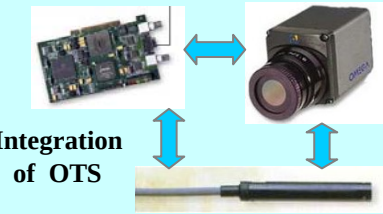
PASSIVE PANORAMIC IMAGE FUSION (PPIF) SUPPORTING ARMED OPERATIONS IN URBAN TERRAIN

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARI

- **PPIF was developed in collaboration with Ford and Sarnoff using OTS imaging sensors and software in the VPL**

- **Benefits**
  - In-theatre MOUT/peacekeeping operations
  - Homeland defense
  - Surveillance

- **Supporters**
  - –PM Stryker /BCT
  - –PM LTV
  - –PM LAV
  - –PM TV
  - –PM FCS
  - –Pentagon G2 office
  - –Secret Service



Integration of OTS

SYSTEM INTEGRATION

Marine LAV

HET FT06-07

Stryker FY05-06

Bradley FY06-07

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Features and Possible Options of an Image Fusion System

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- 360° Panoramic View with portable display
- Systems for high speed convoys
- PASSIVE Day and Night System
  - Far IR
  - Near IR
  - Visible
- Recording Capability
- Threat Identification
- Automatic "Wakeup" and Warning on Threat Detection
- "Zoom-In" Capability
- Color Code Areas of Interest
- Automatically Track Moving Threats and Illuminate Them

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Potential High Volume Applications for Night Vision

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- High speed convoy (multiple vehicle, lights out driving) - 250
- Border surveillance (Homeland security and military) - 500
- Perimeter security around installations and bases - 200
- Night Vision for light tactical vehicles - 250
- Night Vision for marine search and rescue - 100. For example, Selfridge homeland security base.

Realistic estimate of quantities needed is around 1300 for the first year. Probably 1000 units/yr for the foreseeable future to upgrade and replace.

Cost per unit of under 5K ??

Discussion items

♦ Integration and testing of a smaller and hardened military version of the image fusion system on a LAV or Stryker is of interest. TARDEC could be early users and integrators of the Autoliv cameras.

♦We need less expensive, more durable infrared cameras and image processing platforms.

How could the cost of the IR cameras come down with large production?